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CLAIMS

What is claimed is:

1. An apparatus comprising:

a Bragg grating formed in a semiconductive layer attached to an insulating substrate, the Bragg grating comprising:

a plurality of elements of a first substantially electrically insulating material;

and

a plurality of elements of a second substantially electrically insulating material alternating with the elements of said first substantially insulating material.

2. An apparatus according to claim 1, wherein at least some of the first and second alternating elements are substantially in contact with the insulating substrate.

3. An apparatus according to claim 1 wherein the first and second electrically insulating materials comprise first and second, different, types of silicon oxynitride.

4. An apparatus according to claim 3 wherein the first and second different types of silicon oxynitride differ in a relative composition of oxygen and nitrogen.

5. An apparatus according to claim 1 comprising:

a rib waveguide etched in the semiconductive layer in a direction substantially perpendicular to interfaces between the first and second elements of the Bragg grating.

6. A method comprising:

guiding an optical signal; and

performing an optical function on said optical signal using an optical arrangement comprising a Bragg grating having a plurality of alternating elements of first and second, different, substantially electrically insulating materials formed in a semiconductive layer attached to an insulating substrate.

7. A method according to claim 6 wherein performing an optical function comprises:

oscillating said optical signal at a desired frequency.

8. A method according to claim 6 wherein performing an optical function comprises:

reflecting said optical signal.

9. A method according to claim 6 wherein performing an optical function comprises:

filtering said optical signal.

10. A method according to claim 6, wherein the first and second electrically insulating materials comprise first and second, respective, types of silicon oxynitride having first and second, different, compositions of oxygen and nitrogen.

11. An external cavity laser device comprising:

a laser source; and

an external laser cavity defined between said laser source and a Bragg grating formed in a semiconductive layer attached to an insulating substrate, the Bragg grating comprising a plurality of alternating elements of first and second, different, substantially electrically insulating materials,

wherein said external laser cavity is able to oscillate an optical signal generated by said laser source at a substantially fixed frequency determined by the structure of said Bragg grating.

12. An external cavity laser device according to claim 11 wherein at least some of the first and second alternating elements are substantially in contact with the insulating substrate.

13. An external cavity laser device according to claim 12 wherein the first and second electrically insulating materials comprise first and second, different, types of silicon oxynitride.

14. An external cavity laser device according to claim 13 wherein the first and second different types of silicon oxynitride differ in a relative composition of oxygen and nitrogen.

15. An external cavity laser device according to claim 11 comprising a rib waveguide etched in the semiconductive layer in a direction substantially perpendicular to interfaces between the first and second elements of the Bragg grating.

16. An external cavity laser device according to claim 11 further comprising a current injection modulator to modulate an optical signal generated by said laser source.

17. An external cavity laser device according to claim 16 further comprising a power monitor to monitor power of said optical signal.

18. An external cavity laser device according to claim 17 further comprising an optical fiber to transmit said optical signal.

19. An optical system comprising:

an optical transmitter to transmit optical signals;

an optical receiver to receive said optical signals; and

an optical switch on a path of light between said transmitter and said receiver,

wherein at least one of said transmitter and said receiver includes an optical component comprising a Bragg grating formed in a semiconductive layer attached to an insulating substrate and wherein the Bragg grating comprises a plurality of alternating elements of first and second, different, substantially electrically insulating, materials.

20. An optical system according to claim 19 wherein said optical component comprises an optical coupler.

21. An optical system according to claim 19 wherein at least some of the first and second alternating elements are substantially in contact with the insulating substrate.

22. An apparatus according to claim 19 wherein the first and second electrically insulating materials comprise first and second, different, types of silicon oxynitride having first and second, respective, relative compositions of oxygen and nitrogen.

23. An apparatus according to claim 19 comprising:

a rib waveguide etched in the semiconductive layer in a direction substantially perpendicular to interfaces between the first and second elements of the Bragg grating.